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CENTRAL INTELLIGENCE AGENCY

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S E C R E T

COUNTRY Hungary

REPORT

25X1

SUBJECT

DATE DISTR.

28 March 1957

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Hungarian Academy of Sciences:
Central Research Institute for Physics,
Budapest

NO. PAGES

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reports on the Central Research
Institute for Physics of the Hungarian Academy of Sciences in Budapest.
The reports contain information on the location of the Institute, its
departmental organization, the scientific work

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H U N G A R YScientific/Economic

The Central Research Institute for Physics,
Hungarian Academy of Sciences,
BUDAPEST - CSILLERBERG.

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2. The Director of the Institute at present is Professor L. JANOSSY.

3. Departments of the Institute.

The Institute has the following Departments:

- a) SPECTROSCOPY (molecular, absorption, industrial)
- b) COSMIC RAYS
- c) ATOMIC PHYSICS
- d) RADIOLOGY
- e) ELECTROMAGNETIC WAVES
- f) FERROMAGNETISM
- g) ATOMIC PILE PROJECT.

(a) The SPECTROSCOPY Department is not doing much valuable work, due partly to lack of modern apparatus and partly because it is directed by an analytical chemist, [redacted] who is little more than an administrator in this Department and has little scientific interest in the work, except in its relation to chemical analysis. [redacted]

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(b) The Department for COSMIC RAYS is directed by JANOSSY himself, who is now mainly concerned with producing experimental evidence in support of the theoretical basis of the Quantum Theory: his interest in cosmic rays as such seems dwindling.

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/(c) The ATOMIC.....

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(c) The ATOMIC PHYSICS Department is directed by Professor K. SIMONYI, who, is particularly expert in low-energy accelerators (1-4 MeV of Cockcroft-Walton and Van der Graaf types). The main task of this Department has been the development of experimental apparatus and equipment for use in this energy range of 1-4 MeV. Apparatus for detection and measurement in the field of neutron physics also is being developed by SIMONYI.

(d) The RADIOLOGY Department [redacted] is at present working mainly on the industrial applications of radioactive tracer elements, and the development of relevant detectors. The radioactive tracers were obtained from U.S.S.R.

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(e) The Department of ELECTROMAGNETIC WAVES [redacted] has been concerned recently in measurements of nuclear magnetic moments; experiments on quadrupole moment measurement were started late in 1956, using tin iodide. In this Department, a 4.5 MeV "Microtron" has been developed, [redacted]

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Work on electron

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scattering is planned but not yet started.

The Department of ELECTROMAGNETIC WAVES was started in 1950 in order to establish theoretical bases for the development of radar systems. [redacted]

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(f) The Department of FERROMAGNETISM [redacted]

(g) The ATOMIC PILE PROJECT has been separated from Professor SIMONYI's other Department to facilitate security: it was started under the control of Dr PAL.

It was at first hoped to build an Hungarian Reactor, based on [redacted]

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[redacted] the "swimming-pool" type. But on Russian orders, it is generally believed in the University, this was countermanded and a Russian

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/Reactor.....

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Reactor, then in operation in U.S.S.R., was to be purchased by HUNGARY, taken down and re-erected at CSILLEBERC. In May 1955, the contract for its purchase was signed, and the purchase-price (which will be paid for in goods exported from HUNGARY to U.S.S.R.) is about ten times that obtaining on the world-market.

The Pile is a 2 megawatt watercooled type with enriched uranium fuel and with water and NOT graphite as moderator. It was intended to use this pile for neutron research and production of tracer elements; some researches on power production were hoped to be started later, with its help.

Early in 1956, a group of about 12 young physicists and engineers were sent from BUDAPEST to MOSCOW for three months' training. They studied there routine procedures on pile operation (maintenance, control, radioactive hazards and so forth). Another group was sent in September 1956 to study atomic energy physical and chemical research methods but returned at the end of October 1956, having achieved nothing and without an opportunity of even starting their work. This was due not to the Revolution, but to administrative failure. Some 300 persons in all were allocated to this Project. As in January 1957, the work on the Reactor building is well-advanced, and some parts of the structural elements of the pile have arrived from U.S.S.R. About two-thirds of the essential pile and control-gear has arrived from U.S.S.R. but is not even unpacked.

The Revolution has altered the whole future of this project, which is temporarily or perhaps permanently at a standstill. One of the most serious obstacles to its further development, is that no one wished to be in charge of the project, not even Dr L. PAI, formerly head of the Department.

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1. General.

This Institute is at Konkoly Thege Utea, BUDAPEST XII and occupies an area of about 1,700 hectares. The nominal head of the Institute is KOVACS, Istvan, but his scientific abilities are not highly regarded by his staff who consider that he was given his position for political reasons. The de facto head of the Institute is Professor JANOSSY. In all the laboratories employed about 20-25 qualified chemists, 40 Physicists, 55-60 Engineers (mechanical and electrical) and 25 laboratory assistants. These figures do not include those persons working on the nuclear reactor which was expected from the U.S.S.R., and who were isolated from the rest of the staff. From May to October, 1956 about 300 persons were employed in the reactor section and it was rumoured that when the reactor was eventually received this figure would rise to 500. PAL, Lenart, who had spent about a year in the U.S.S.R. studying Soviet Reactors, and who had possibly not returned to HUNGARY when the revolution broke out was understood to have been named as the head presumptive of the reactor section.

2. The Chemical Section.

The head of the Chemical Section was VORSATZ, Bruno, but the work of the Heavy Water Laboratory, although it employed only chemists, was controlled by SIMONYI, Karoly, the physicist who was also in charge of the fast particle physics section (see below, para. 3 (d)). In this laboratory work had been going on for about 6 months previous to the revolution on the production of D_2O by electrolysis. Some 60-70 litres of water were used as electrolyte and a current density of 2-3 amps/sq.cm. was employed. About 600 volts from secondary cells was available. The electrodes used were of pure iron. As a result of the 6 months work rather less than one gram of water containing 70% D_2O had been extracted. Those working in the laboratory were told that the heavy water was required as a moderator for the reactor that was to be received from the U.S.S.R. and were given to understand that it required water of 88-90% D_2O .

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No published work, in any language, on the production of heavy water by electrolysis was available to the laboratory.

3. Other chemical work at the Institute was on the production of pure..... 25X1

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pure boron trifluoride for G.M. counters, and of stannous chloride as a conducting coating for the interior surfaces of G.M. tubes. In 1953 or 1954 the Institute produced a number of G.M. counters (details unknown) for the Hungarian Army, as well as supplying prototype counters which were then put into production at the Iradagep Keszletezo Vallalet. Hearsay at the Institute put the total number produced at 1,000.

4. Other Sections.

(a) Radiology. Head of Section, BOZOKI, Stanislaus. Carried out work on behalf of industry (? also for medical purposes). [redacted] the following radio-active isotopes were available at the Institute:- P₃₂, Fe, Cl, Na; [redacted]

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(b) Spectroscopy. Work was being carried out on emission spectroscopy & absorption spectroscopy (mainly as an aid to chemical research at the Institute). Some work was also undertaken on the design of spectrometers suitable for various industrial requirements. All spectrometers [redacted] in use were made in GERMANY. 25X1

(c) Infra-Red Research. Head of Research: LANG, Laszlo; head of the infra-red apparatus design: BORONKAY, Attila. LANG, a chemist by training, was largely concerned with office work. Infra-red work at the Institute was in its infancy, most of the effort being concerned with the construction of apparatus to allow research to be started. The Hungarian Optical Works of OSORSZ (?CSERKESZ) Utc., BUDAPEST XII, made lens etc. for infra-red work. The Gamma Optical Works were also trying to produce 30 sets of infra-red apparatus (details unknown), but had encountered many difficulties.

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(d) Fast Particle Physics. Head: SIMONYI, Karoly, though Professor JANOSSY took considerable interest. This section had two Van der Graaf accelerators of 1 Mev. and 600,000 e.v. [redacted] there were also one or two linear accelerators, and was certain that FARAGO, Peter, a physicist, had been sent from the Institute to the U.S.S.R. to study the operation and construction of such equipment.

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(e) Cosmic Ray Research. [redacted]

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[redacted] in view of his world-wide reputation in this subject, JANOSSY was in charge.

(f) Institute Workshops. This employed about 400 men whose main concern was to construct apparatus for the research sections.

[redacted] the work produced was of extremely poor ~~SECRET~~ 25X1

/5. Miscellaneous... 25X1

5. Miscellaneous.**SECRET**

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(a) Apart from the [] any member of the Institute could go into any other section of the establishment. There had been no restrictive security precautions in operation apart from the time in 1953/4 when G.M. counters were being produced for the army (see para. 3 above). In particular [] no G.W. work was being undertaken by the chemical section.

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(b) Uranium Extraction from Coal.

[] coal ash from which [] it would be economic to extract the Uranium. [] the coal was mined in the BAKONY Mountains. []

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(c) Allied Institutes.

[] SZALAY, Alexander was in charge of an Institute at DEBRECEN which carried out work very similar to that of the Central Physical Research Institute. SZALAY was generally considered to be anti-Communist.

6. Expansion of the Institute. Considerable new building was under way, mainly for the reactor section. A new single-storey laboratory block had been designed by the Architectural Section of the Hungarian Academy of Sciences (Magyar Tudományos Akademia) of 9, Roosevelt Square, BUDAPEST, V. This block was 80m. long by 20m. wide. It had a central corridor with 14 rooms on either side for use as laboratories. No further details are available.

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Scientist

Work Done at the Central Physical Research
Institute, BUDAPEST

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The schematic lay-out for the above Institute

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was drawn by an engineer and scientist originally employed by Messrs. TUNGSRAM working in the Valve Department (klystrons, etc.) and latterly in the Central Physical Research Institute, where he worked between the engineering group and general planning group under Head of the Atomic Research Reactor Division.

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2. The whole of the Central Research Institute, with the exception of the Spectro-chemical Research Laboratories, was housed together in a group of buildings covering an area of 40 Hungarian holds on the Janos Hill outside BUDAPEST. Personnel employed by the Institute totalled approximately 500 ~ 550 men and women.

3. The Institute did not work under any direct instructions from MOSCOW, though individual Heads of Departments were in the habit of going to RUSSIA for consultation. Sometimes they went to acquire knowledge on new developments and sometimes to impart their own findings.

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4. The Spectro-chemical Laboratory, though coming directly under Professor JANOSSY was actually housed in the Technical University of BUDAPEST. There was never any very clear overall priority target to which the Institute as a whole adhered. Priority work as such varied by departments. In November, 1946, the subject to which most sections gave priority was concerned with the detection of Atomic Contamination and means for decontamination. Equal in priority was work being done in instruments for the detection of radio activity. There was always considerable friction between the Institute and the

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military authorities, the latter often wishing the Institute to undertake work which Dr. JANOSSY was disinclined to do.

5. Members of the Cosmic Ray Laboratory under Dr. JANOSSY were often in BULGARIA and in contact with Bulgarian scientists; the reason being that the Hungarian Government had built a complete Cosmic Ray Laboratory and Research Station on the Stalin Hill in BULGARIA. Members of Professor JANOSSY's team often in BULGARIA included Doctors NARAY and ZSOLT. These last two mentioned were in BULGARIA early in 1956 and later visited RUMANIA.

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